Staff Summary Report

Tempe

Council Meeting Date: 07/22/08 **Agenda Item Number:** _____

SUBJECT: Request approval of an addendum to a professional services contract with Advantica, Inc. for Geographical Information System (GIS) implementation at the Water Utilities Department.

DOCUMENT NAME: 20080722PWDR03 **WATER MANAGEMENT ADMINISTRATION (0811-13) PROJECT NO. 3202022**

SUPPORTING DOCS: Yes.

COMMENTS: Total addendum not to exceed $53,700.

PREPARED BY: DONNA RYGIEL, ENGINEERING CONTRACT ADMIN. (x8520)

REVIEWED BY: ANDY GOH, DEPUTY PW MANAGER/CITY ENGINEER (x8896)

APPROVED BY: Glenn Kephart, Public Works Manager (x8205)

LEGAL REVIEW BY: Judi Morgan, Assistant City Attorney (x8779)

FISCAL NOTE: Sufficient funds are available in Capital Improvement Fund No. 3202021, Water Utilities Department GIS System.

RECOMMENDATION: Approve addendum.

ADDITIONAL INFO: This addendum provides for the integration of the Water Utilities Department's existing hydraulic water model into the new Water Department GIS system (W-GIS).

The fee was negotiated by staff and is considered reasonable for the scope of services. The original contract amount was $633,750. The previous addendum was for the amount of $40,200. This addendum will increase the contract amount to $727,650.

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CITY OF TEMPE, ARIZONA
PUBLIC WORKS DEPARTMENT
DIVISION OF ENGINEERING

ADDENDUM NO. 2
To Contract for Professional Services for Water Department GIS Implementation

PROJECT NO. 3202022

PROJECT NAME: WATER DEPARTMENT GEOGRAPHIC INFORMATION SYSTEM (GIS) IMPLEMENTATION

This Addendum made and entered into on the 22nd day of July 2008, by and between the City of Tempe, a municipal corporation, hereinafter called the "City" and Advantica, Inc., hereinafter called the "Consultant".

RECITALS:

A. The parties hereto entered into that certain Contract for Professional Services on or about November 16, 2006 (hereinafter "Contract"), defining certain rights and obligations between the parties in order to provide design services.

B. The parties desire to further define their respective rights and obligations with respect to the services of the Consultant, period of service and compensation.

C. The parties intend that the following sections shall be integrated into the Contract in place of the former similarly identified section(s), and that this addendum be given the full force and effect of law as the Contract.

Now therefore, in consideration of the mutual promises and covenants as more particularly set forth below, the parties do hereby amend the Contract to read as follows:

I. The Consultant shall integrate the City's Water Utility Department's existing water model into the new Water Department GIS, as described in Exhibit "A", attached hereto and incorporated herein by this reference.

II. The Consultant shall proceed with the work immediately upon execution of this Addendum and all services shall be completed by September 9, 2008.

III. For services described herein, the method of payment shall be payment by installments. Total compensation for services performed shall not exceed $53,700.00, which shall constitute payment in full for all labor, equipment, materials and supplies needed to perform these services. This fee includes an allowance of $12,600.00 for reimbursable expenses, which in no event will ever be more than actual cost.

Cost Analysis:	Professional Services	Reimbursables	Total
Initial Contract Amount	$610,000.00	$23,750.00	$633,750.00
Previous Addenda	$34,200.00	$6,000.00	$40,200.00
This Addendum	$41,100.00	$12,600.00	$53,700.00
NEW CONTRACT AMOUNT			$727,650.00

All other provisions of the Contract not inconsistent with this Addendum shall remain binding on the parties hereto.

Water Department GIS Implementation
Project No. 3202022

DATED this _____ day of _____, 2008.

CITY OF TEMPE, ARIZONA

By:_____
Mayor

By:_____
Public Works Manager

ATTEST:

_____
City Clerk

Recommended By:

_____
Deputy PW Manager/City Engineer

APPROVED AS TO FORM:

_____
City Attorney

The CONSULTANT warrants that the person who is signing this Agreement on behalf of the CONSULTANT is authorized to do so and to execute all other documents necessary to carry out the terms of this Agreement.

CONSULTANT
Advantica, Inc.

_____
Name

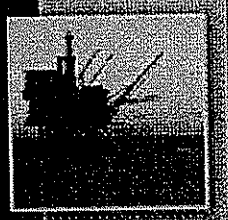
_____
Title

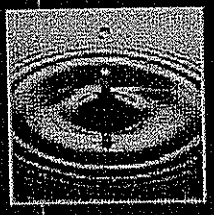
_____
Federal I.D. No. /Social Security No.

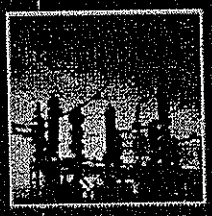
Certified to be a true and exact copy.

_____
Karen M. Fillmore
Records Specialist

EXHIBIT A







ADVANTICA

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STONERSOFTWARE

Scope of Work for SynerGEE Water Integration With The New TEMPE GIS

City of Tempe, Water Utility Department

April 22, 2008

Enhancing Safety and Performance

MAW

Table of Contents

Understanding and Relationship

Throughout the calendar years of 2006 and 2007, the Tempe Water Utility Department (WUD) teamed with Advantica and Marshall to implement an enterprise GIS system for the WUD, integrating the new GIS to the Department's Hansen asset and work management system. The new GIS system, referred to as WGIS throughout the remainder of this document, phased into a production mode of operation during the last quarter of 2007. All WUD water, wastewater, storm, and irrigation assets are now maintained in the new WGIS system.

Background

As acknowledged in several formal written documents pertaining to the Tempe WGIS initiative (e.g. needs assessment, GIS scope of work, etc.), several key business drivers for the WGIS implementation have been captured, among them:

* Supporting the creation and maintenance of the Department's SynerGEE hydraulic model
* Providing the foundation for more advanced applications such as SCADA-linked hydraulic modeling and an Operations Dashboard intranet environment for monitoring system operations
* Enhancing the integrity of the Department's existing information
* Enabling better ongoing maintenance of the Department's information

The WGIS implementation project continuously accounted for these business drivers, taking them into consideration during database design efforts and within the editing and quality checking tools provisioned as part of the project. Also included within the project scope to support these business drivers was a requirement for the new GIS to integrate with the SynerGEE Water network analysis software. In essence, the project called for a mechanism to enable the building of SynerGEE models directly from the GIS data.

Integrating the new GIS with SynerGEE

As the WGIS implementation approached the production deployment phase, in accordance with the original project plan Advantica began efforts to implement our proven and preferred mechanism for GIS-SynerGEE integration, commonly referred to as the "DataPrep/MiddleLink" approach. Within this approach, water facilities are pushed out of the GIS via a custom GIS application referred to as DataPrep, then imported into SynerGEE through the SynerGEE MiddleLink product module.

As the integration approach commenced, several issues were quickly identified that caused concern and consideration over proceeding with the intended GIS-SynerGEE approach, namely:

1) The new GIS system was populated with facility asset and attribute information from several different data sources, primarily from TGIS. While TGIS was the primary data source for most information in the new GIS, the TGIS source data is believed to NOT be as accurate with pipe information as is the current WUD SynerGEE model. This priority was not accurately defined during the data conversion planning process and as a result pipe dimension, and material type were pulled from TGIS, not the SynerGEE model. Hence, the material and dimension information for water distribution pipes in the new WGIS is arguably out of date.
2) Along with outdated attribute information, the WUD has corrected erroneous connectivity information in the SynerGEE model, but not necessarily within TGIS. As a result, there are likely hidden connectivity anomalies in the new WGIS carried over during the TGIS data migration.
3) The WUD relies heavily on their existing SynerGEE model, which has been maintained independently from the information in TGIS.
4) Advantica was successful in releasing the Model Builder Module in the last release of SynerGEE Water. Model Builder was not available at the time of the original GIS implementation plan.

Considered Alternatives

Advantica and Tempe discussed several alternatives for moving forward with the integration:

1) Taking steps to update the information in the GIS with more current information from SynerGEE, then proceeding with the standard integration approach.
2) Keeping the existing SynerGEE model as the production model and building an integration solution which would extract only new information (e.g. Design Layer) from the GIS.
3) Assuming the GIS data is accurate and proceeding with the original integration approach.

Option 3 was quickly abandoned - Why build a model from inaccurate source information? Option 2, while attractive on the surface, carries several risks and complex challenges (e.g. lack of a one-to-one mapping of assets between SynerGEE and GIS, SynerGEE model reprojections, and the continued requirement for parallel data maintenance activities, something that is contrary to one of the original business objectives.

*** Recommendation ***

As a result of the evaluation, Advantica is recommending a GIS-SynerGEE integration approach based on option 1 above. The recommend approach will provide the following benefits:

1) Further improve the quality of the data in WGIS, thus making the data more suitable for other business uses.
2) Eliminate the need for duplicate data maintenance activities - WGIS becomes the primary source for SynerGEE model building.
3) Provide a new and more detailed SynerGEE model.
4) Provide a repeatable process for building new and/or updating existing SynerGEE models at any time from WGIS.

This proposal, which in effect represents an extension to the original GIS implementation project, describes Advantica's new recommended approach and the associated costs for integrating the new Tempe GIS to SynerGEE.

Scope of Services

Advantica recommends the following high level tasks for building a quality integration solution between the new TEMPE WGIS and SynerGEE:

1) Update WGIS water distribution pipes with SynerGEE pipe diameter and friction factor attribute data.
2) Convert the current SynerGEE model to NAD 83 Arizona State Plane - feet.
3) Build a new SynerGEE facilities model from the WGIS.
4) Identify potential WGIS connectivity problems by loading the new SynerGEE model from the demand scenario of the existing SynerGEE model.
5) Correct WGIS, if applicable, based on findings of task 4.
6) Build new SynerGEE facilities model reusing process developed in task 3, including training to Tempe staff in use and application of the Model Builder module.
7) Develop new load scenario based on current Banner data.
8) Combine new SynerGEE facilities model with new load information and verify against field measurements.

Following the completion of the above tasks, the Tempe WUD will be in possession of a new SynerGEE model built directly from the new WGIS and from current customer billing information. More importantly, the WGIS will be updated to include the newest and most accurate asset information for the Tempe water distribution system. As a result, the WGIS becomes the central source of data for all future water modeling initiatives, as well as for the maintenance of their SynerGEE model - duplicate data maintenance is eliminated. A more detailed description of each task follows.

Task 1: Update the WGIS with SynerGEE pipe dimension and material type data.

The Tempe WUD will update the GIS pipe attribute data with the more current corresponding data from the TEMPE SynerGEE model. Advantica will provide up to eight hours of remote support to Tempe in the completion of this task.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. Up to 8 hours of remote support to Tempe to support and/or verify the update of the WGIS with information from SynerGEE.	1. Tempe WUD will be responsible for the creation and application of any scripts or procedures to the WGIS to update any necessary data with more current information from SynerGEE 2. Tempe staff will run the appropriate Marshall synchronization tool to transfer changes to Hansen. 3. Tempe will review and signoff on updated WGIS database.
Assumptions:	

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1. Tempe is confident that water pipeline information in the current SynerGEE model is more accurate than the information transferred from TGIS.

Task 2: Convert the SynerGEE model to NAD 83 Arizona State Plane - feet.

To support future reference between current SynerGEE model and any future model built from WGIS, it will be necessary to re-project the current SynerGEE model into the NAD 83 Arizona State Plane projection on which the WGIS is based. Advantica will perform this task.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. A new SynerGEE model, identical to the current operational model, re-projected to NAD 83 Arizona State Plane - feet.	1. Tempe will provide Advantica with a copy of the current SynerGEE model.
Assumptions: None	

Task 3: Build a new SynerGEE facilities model from the WGIS.

To eliminate duplicate data maintenance, meaning to automate the process of moving changes from WGIS to SynerGEE thus enabling a single point of data maintenance, it is imperative that there be a one-to-one correspondence between the elements in WGIS and SynerGEE. As such, a critical step in the WGIS to SynerGEE integration for Tempe is to build a new SynerGEE model directly from WGIS, replacing the existing base SynerGEE model, which does not have the required one-to-one correspondence with WGIS. Using the SynerGEE Model Builder (MB) Module, Advantica will build a new SynerGEE facilities model directly from WGIS.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. A Model Builder configuration (re-usable) which will extract a new SynerGEE model from WGIS. 2. A SynerGEE facility model (unloaded and unbalanced) based on the facilities in WGIS.	1. Tempe will be required to purchase the Model Builder module of SynerGEE. 2. Tempe will provide Advantica access to the Tempe WGIS.
Assumptions: None	

Task 4: Identify potential water distribution connectivity problems in WGIS.

To identify potential connectivity anomalies in WGIS, Advantica will transfer the load scenario of the existing SynerGEE model to the newly created facilities model, and configure the new model to balance. By comparing the new SynerGEE model to the old SynerGEE model, Advantica will identify discrepancies and discuss with Tempe any WGIS corrections (e.g. connectivity) which may be necessary.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. A new, balanced, SynerGEE model, containing	1. Tempe will provide Advantica with a

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facilities as represented in WGIS and a load scenario as utilized in the current operational SynerGEE model. 2. A discrepancy report between the new SynerGEE model and the old, identifying a list of corrections which Tempe will apply to WGIS.	copy of their existing SynerGEE model. 2. Tempe modeling staff will work with Advantica to identify discrepancies between the current and new SynerGEE models.
Assumptions: 1. Load scenario will consist of flows or constant pressure settings from system sources, starting tank levels, node (customer) demands and diurnal profiles for all flow categories, pump status and controls, pump performance curves, regulator settings, and valve positions to best match the current operational SynerGEE model.	

Task 5: Correct WGIS, if applicable, based on findings of Task 4.

The Tempe WUD will assume responsibility for making any necessary changes to the WGIS to correct issues which are deemed to significantly impact the model building process. Advantica is suggesting a duration of 10 business days to accomplish this task. Actual duration will be based on the quantity of modifications required.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. Advantica has scheduled 8 hours of support time within this task to assist Tempe with the necessary changes.	2. Tempe will make all necessary corrections to the water distribution data in WGIS, as identified in the previous task.
Assumptions: None	

Task 6: Build new SynerGEE facilities model reusing process developed in Task 3.

Similar to Task 3 above, Advantica will re-apply the Model Builder scripts developed in Task 3 to rebuild a new SynerGEE facilities model. Advantica will then re-apply the current SynerGEE load scenario and verify that the two models produce similar results (within a tolerance of 10% for representative pressures, flows, and tank levels). At the successful completion of this task, Tempe will have a proven and repeatable process for building new SynerGEE facility models from WGIS as well as a new SynerGEE model built directly from TGIS.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. A new SynerGEE facility model, built directly from WGIS, loaded with the older SynerGEE model demand scenario. 2. On-site training in the configuration and application of Model Builder to build new SynerGEE models from WGIS as well as to maintain the SynerGEE model with incremental changes from WGIS.	1. Review and sign off of the new SynerGEE model. 2. Participation in the on-site Model Builder training.
Assumptions: 1. Representative pressures and flows for comparison points will be determined by selecting key	

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facilities in the system, typically at pump stations, regulator stations, reservoirs, and connection points between pressure districts.

Task 7: Develop new load scenario based on current Banner data.

This task represents the effort of building a more current load scenario for the Tempe operational SynerGEE model.

Often overlooked in the science/art of network modeling is load modeling. While the majority of model building efforts generally focus around the facility models development, the importance of accurate model loading is often overlooked.

Tempe WUD SynerGEE modeling staff have acknowledged that there are errors in the loading scenario of the current SynerGEE model. As a result, these errors will be carried over to the new SynerGEE facility model built from WGIS. While unlikely to significantly affect system pressures and tank levels, inaccurate model demands will likely impact system flow balance, water quality, and water age analyses. Significant demand errors in the area of key facilities may also impact pressures and simulated reservoir operation in the model.

Once the Tempe WUD has a new SynerGEE facility model built from WGIS, the next logical step will be to improve the accuracy of the model by updating the model loads based on more current customer information available from Banner. Advantica will develop the new SynerGEE load scenario, providing a customer management database and a SynerGEE exchange file for application to the new model.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. A SynerGEE exchange file representing model load, based on current Banner billing data.	1. Provide a snapshot of customer data from the Banner billing system to include average flows (preferably annual average) and customer location (x,y coordinate) 2. Assist in verifying the location and assignment for customers without x,y coordinates.
Assumptions: 1. Advantica assumes that 80% of the customers in the Banner database contain x,y coordinates representing customer location. For those customers not containing x,y coordinates, Advantica will perform geocoding on the address or street intersection provided and will provide a list of assignments to Tempe WUD for verification. 2. Advantica will not perform manual location of customers without x,y or address/intersection data and will not perform individual verification of x,y coordinates.	

Task 8: Combine new SynerGEE facilities model with new load information and calibrate the model against field measurements.

This l task represents Advantica's efforts to apply a new loads scenario (developed in task 7 above) to the new SynerGEE facility model, and to verify that model against live field measurements. Model verification against field measurement would be the final step in replacing Tempe's current operational SynerGEE model, removing all dependency on the older model.

Advantica Deliverables:	**Tempe Water Department Responsibilities:**
1. A new SynerGEE facility model loaded with the newly built demand information derived from Task 7 efforts (i.e. from Banner). 2. A modified SynerGEE model, calibrated to within a 10% pressure tolerance of field measurements	1. Tempe will be required to collect system pressure and flow measurements at key facilities such as reservoirs, treatment plants, pump stations, and pressure regulating stations within each pressure district.
Assumptions: None	

Cost

Service Fees

Task	Cost
1) Update WGIS water distribution pipes with SynerGEE pipe dimension, length, and material attribute data.	$1,800
2) Convert the current SynerGEE model to NAD 83 Arizona State Plane - feet.	$3,200
3) Build a new SynerGEE facilities model from the WGIS.	$6,000
4) Identify potential WGIS connectivity problems by loading the new SynerGEE model from the demand scenario of the existing SynerGEE model.	$13,300
5) Correct WGIS, if applicable, based on findings of task 4.	$1,800
6) Build new SynerGEE facilities model reusing process developed in task 3. * includes on-site Model Builder Training (1 Trip)	$18,600
7 & 8) Develop new load scenario based on current Banner data; includes 2 Trips.	$26,200
TOTAL Services	$70,900

Product Fees (see attached quotation)

Product	Cost
Model Builder (MB)	$ 12,600

* Subject to annual M&S as shown in attached software product quotation

Total Solution Fees (service + product)

Services plus Model Builder Product	$ 83,500
Less Existing Contract Credit	($30,000)
Total Fee Increase	$ 53,700

Billing and Payment

All charges will be invoiced to the client at the end of the month in which the work is performed or in which invoices are received by Advantica for outside expenses.

All rates are in United States Dollars ($).

Schedule

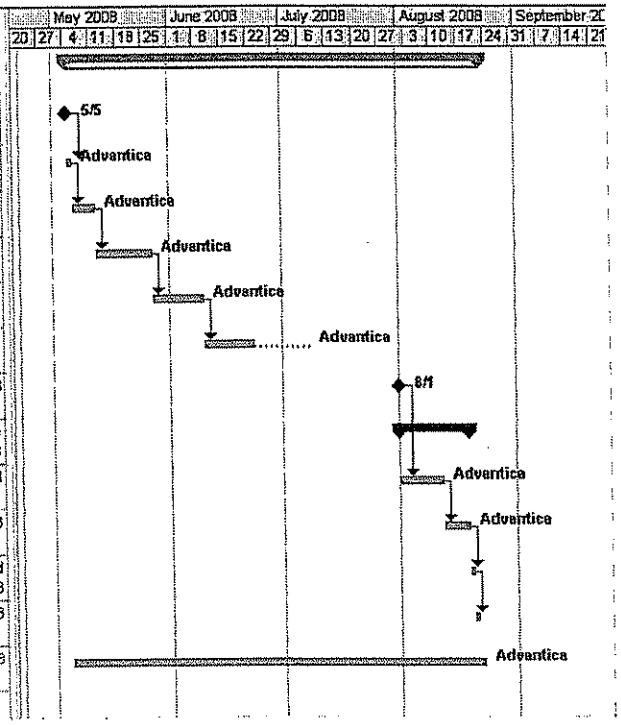
Based on a May 5, 2008 start date and the Gantt chart below, Advantica anticipates the following billing schedule for the earlier described tasks:

Anticipate Billing Schedule

Task	Invoice Amt	Approx Invoice Date
1) Update WGIS water distribution pipes with SynerGEE pipe dimension, length, and material attribute data.	$1,800	End May 2008
2) Convert the current SynerGEE model to NAD 83 Arizona State Plane - feet.	$3,200	End May 2008
3) Build a new SynerGEE facilities model from the WGIS.	$6,000	End June 2008
4) Identify potential WGIS connectivity problems by loading the new SynerGEE model from the demand scenario of the existing SynerGEE model.	$13,300	End June 2008
5) Correct WGIS, if applicable, based on findings of task 4.	$1,800	End July 2008
Pending July 2008 Council Approval and Aug 1 NTP		
6) Build new SynerGEE facilities model reusing process developed in task 3.	$18,600	End Aug 2008
7 & 8) Develop new load scenario based on current Banner data; includes 2 Trips.	$26,200	End Aug 2008
Model Builder (MB) Product Invoice	$ 12,600	Early Aug 2008

Gantt

	Name	Duration	Start	Finish
0	Tempe WGIS-SynerGEE Integration	80 days	Mon 5/5/08	Fri 8/22/08
1	*Begin SynerGEE Integration Tasks*	*0 days*	*Mon 5/5/08*	*Mon 5/5/08*
2	1) Verify update of WGIS water distribution pipes with SynerGEE pipe	1.33 days	Mon 5/5/08	Tue 5/6/08
3	2) Convert the current SynerGEE model to NAD 83 Arizona State Plane - feet.	4 days	Tue 5/6/08	Mon 5/12/08
4	3) Build a new SynerGEE facilities model from the WGIS.	10 days	Mon 5/12/08	Tue 5/27/08
5	4) Identify potential WGIS connectivity problems by loading the new SynerGEE	10 days	Tue 5/27/08	Tue 6/10/08
6	5) Correct WGIS, if applicable, based on findings of task 4.	20 days	Tue 6/10/08	Tue 7/8/08
7	*Council Approval Received - NTP Issued*	*0 days*	*Fri 8/1/08*	*Fri 8/1/08*
8	**6) Build new SynerGEE facilities model reusing process developed in**	**12.58 days**	**Fri 8/1/08**	**Tue 8/19/08**
9	Build Final Model and Document Process	7.58 days	Fri 8/1/08	Tue 8/12/08
10	On-Site Training	5 days	Tue 8/12/08	Tue 8/19/08
11	7) Optional: Develop new load scenario based on current Banner data.	1 day	Tue 8/19/08	Wed 8/20/08
12	8) Optional: Combine new SynerGEE facilities model with new load information	1 day	Wed 8/20/08	Thu 8/21/08
13	Project Management	80 days	Mon 5/5/08	Fri 8/22/08



Software License Agreement

A Software License Agreement between the City of Tempe and Avantica exclusively will govern the use of Stoner Software by the City of Tempe. Tempe's current Software License Agreement will be amended to include the Model Builder Stoner Software module as part of the contracting efforts associated with this proposed scope of work.

This proposal is valid through July 31, 2008.

Quotation

Prepared for: Alan Tanana
Company: City of Tempe
Quote #: COT031708
Date: 04-16-08
Valid until: 05-30-08

ADVANTICA

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www.advanticagroup.com

DESCRIPTION	PLATFORM	CURRENCY	PRICE
One (1) permanent license of the SynerGEE Water Model Builder. **City of Tempe – Existing services customer 25% discount.** **Model Builder – Final Price** **Model Builder Annual M&S**	Intel Pentium® class processor or higher running Microsoft Windows® 2000 or XP operating system	U.S.	**SynerGEE Water Model Builder Module - $16,800** **(- $4,200.00)** **Model Builder Final Price $12,600.00** **Model Builder Annual M&S Fee: $1,920** **Note: M&S fee is included with the license fee for year one. Total M&S fee will increase by $1,920 in year two.**

MAINTENANCE AND SUPPORT		
Options Included	No	Regular Training at Courses in Our Offices
	No	Web-based Learning
	Yes	24 hr - Email, Telephone and Fax Support
	Yes	Error Correction
	Yes	Updates
	Yes	Enhancements

TERMS AND CONDITIONS		
Documents Required	**Yes/No**	**Document**
	Yes	Software License Agreement
	Yes	Tax Exemption Certificate (If your organization is tax exempt)
	Yes	Purchase Order
	No	Letter of Credit (consistent with Advantica terms and conditions)
	No	Advance Payment

Delivery	Within thirty (30) days after Advantica receives all required documents.
Shipping	Standard software ship method is UPS Ground. Other service is additional.
Payment Terms	NET 30 days
Taxes	Prices quoted do not include any applicable taxes unless otherwise stated. If your organization is tax exempt or pays any government tax directly, you must provide Advantica with a tax exemption certificate at the time of your order or the government tax will be added to your invoice if we are required to do so.

Sincerely,

John C. Howell
Business Development Manager – Water
Advantica, Inc.
john.howell@advanticagroup.com
4006 Dobbs Dr.
Huntsville, AL 35802
Tel +1 256 881 7668
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